

CLAIMS

What is claimed is:

1. An apparatus for manipulating a preparation device for preparing an intervertebral space, the apparatus comprising:
 - an extension having a longitudinal axis;
 - at least two prongs coupled to a fulcrum located at a distal extension end of the extension, each of the prongs having a prong extension, the prong extensions together defining a contractable and expandable holding enclosure for holding the preparation device; and
 - a sleeve that surrounds at least a portion of the distal extension end including the fulcrum and at least a portion of the two prongs, and that is collinear with the extension longitudinal axis, and that is rotatable about the extension longitudinal axis;wherein rotation of the sleeve about the extension longitudinal axis brings an inner surface of the sleeve to bear on at least one of the prongs to move the holding enclosure to a contracted state in which the preparation device cannot be removed from the holding enclosure.
2. The apparatus according to claim 1, wherein the manipulating includes at least one of holding, inserting, repositioning, removing, impacting, and extracting.
3. The apparatus according to claim 1, further comprising a handle having a distal handle end coupled to a proximal extension end of the extension.
4. The apparatus according to claim 1, further comprising a flange that facilitates the rotation of the sleeve.
5. The apparatus according to claim 1, wherein the holding enclosure is cylindrical.
6. The apparatus of claim 1,
 - wherein a first of the prongs is spring-loaded with respect to a second of the prongs to bias the holding enclosure to a receptive state in which the first prong and the second prong are

separated by a receptive state distance that does not allow an desired engagement diameter of the preparation device to pass between a first prong distal end of the first prong and a second prong distal end of the second prong without altering a position of at least one of the prongs;

wherein a manual pushing, using a force great enough to overcome the bias, of the preparation device in a proximal direction along the extension longitudinal axis between the first prong distal end and the second prong distal end brings the holding enclosure to an expanded state in which the first prong and the second prong are separated by an expanded state distance that allows the desired engagement diameter of the preparation device to completely pass between the first prong distal end and the second prong distal end, the spacing and dimensioning of the two prongs relative to the sleeve permitting such bringing of the holding enclosure to the expanded state; and

wherein rotation of the sleeve about the extension longitudinal axis brings an inner surface of the sleeve to bear on at least one of the prongs to move the holding enclosure to a contracted state in which the holding enclosure cannot be brought to the expanded state.

7. The apparatus according to claim 6, wherein the spring-loading of the prongs relative to one another is effected by at least one of a dimension of at least one of the prongs and a material strength of at least one of the prongs.

8. The apparatus according to claim 6, wherein the distal extension ends are tapered more narrowly toward the holding enclosure to facilitate passage of the preparation device therethrough.

9. The apparatus of claim 1, wherein the sleeve is biased toward stopping its rotation at desired positions.

10. The apparatus of claim 9, wherein the biasing is effected by at least one plunger and at least one recess cooperating with the plunger at the desired position.

11. The apparatus according to claim 10,
wherein at least one recess is located on an outer surface of the extension, at least one sleeve wall bore penetrates through a wall of the sleeve; and at least one plunger is located

within at least a portion of at least one of the sleeve wall bores;

wherein at least one of the plungers is biased from an inner sleeve surface of the sleeve radially inward toward a longitudinal sleeve axis of the sleeve;

wherein as the sleeve rotates about the longitudinal extension axis of the extension, at least one of the plungers aligns with at least one of the recesses allowing at least one of the plungers to expand radially inward such that at least a portion of at least one of the plungers is contained within at least a portion of at least one of the recesses.

12. An apparatus according to claim 1, wherein the plunger includes a spring.

13. An apparatus according to claim 1, further comprising:

at least one sleeve bore through a longitudinal sleeve axis of the sleeve having a sleeve bore width of the sleeve bore that is greater than a sleeve bore depth of the sleeve bore;

wherein aligning outwardly facing surfaces of the prongs longitudinally along the sleeve bore width allows the prongs to expand fully without interfering with an inner surface of the sleeve bore; and

wherein aligning the outwardly facing surfaces of the prongs longitudinally along the sleeve bore depth causes interference between at least one of the outwardly facing surfaces of at least one of the prongs and at least one of the inner surfaces of the sleeve bore.

14. An apparatus according to claim 13, wherein at least one of the sleeve bores includes at least one corner having a corner curvature shaped as a radius of the sleeve bore; and wherein at least one outwardly facing surface of at least one of the prongs is curved such that the curved prong and the corner curvature facilitate the rotation of the sleeve.

15. An apparatus according to claim 1, wherein at least one of the prongs terminates in at least one extent.

16. An apparatus according to claim 15, wherein at least one of the extents has a thickness less than a width of an annular groove of the distraction device.

17. An apparatus according to claim 15, wherein at least one of the extents widens

outwardly.

18. An apparatus according to claim 15, wherein at least one of the extents is ridged.
19. An apparatus according to claim 15, wherein a first semicircular extent has a first inwardly facing extent surface of the first semicircular extent that faces a second inwardly facing extent surface of a second semicircular extent such that the first and second inwardly facing extent surfaces form the holding enclosure.
20. An apparatus according to claim 19, wherein the rotation of the sleeve contracts and expands the first and second inwardly facing extent surfaces relative to each other.